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ESTABLISHING A TELEPHONE DIAL ACCESS MEDICAL TAPE RECORDING LIBRARY. A REPORT.

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Modern communications methods make it possible to provide post graduate education for physicians at a time and place convenient to them, and at a time when they are most receptive to new information. This project involves a library of tape recordings of 4-6 minutes duration, available by telephone dial access to practicing physicians. The recordings contain information of an emergency nature or present current recommended procedures. A list of available topics is circulated to physicians and they may call at any time of the day or night, request a recording, and it is played for them over the telephone line. A feasibility study, involving 88 tapes, has been conducted. This project will expand the library to 200 tapes, establish a duplicate library elsewhere in the state, continue exploration of transmission methods, explore increased automation, and evaluate the value and effectiveness of the system. (Document includes sample budget, summary of utilizations, and evaluation forms.) (SIE/aj)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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A Report

Establishing a Telephone Dial Access Medical Tape Recording Library

In an effort to provide physicians immediate access to authoritative medical information, an experimental telephone dial access tape recording library was established in April of 1966 as a nine-month feasibility study by the Department of Postgraduate Medical Education of the University of Wisconsin Extension and Medical Center. On the basis of this feasibility study, the next 12 months were spend on further experimentation and expansion of the system under a grant from United Health Foundations, Inc. After 21 months' experience, it is felt that this system shows sufficient promise to suggest development of similar services in other states and regions. This report is intended to be helpful to others contemplating establishment of dial access libraries and to encourage expansion of the basic concept.

The Hardware

After examination of the hardware available on the market, the system was developed utilizing equipment manufactured by Ortronics, Inc., 1941 Franklin Avenue, Toledo, Ohio 43601, under the brand name "Cousino". Following is a listing of equipment and materials utilized:

	Approximate Price
Cousino Repeater, Model R-7320	$100.00
Cousino Recorder-Repeater, Model RR-7331	150.00
Echo-Matic Self-Threading Cartridge, 1410MT	2.00
U-Tape-It-Kit, K6	10.70
Tape Splicer, Robins TS-4J	5.50
Audio Tape, 3M 150-¼-1800, polyester base	3.34
Lubricated Audio Tape, 3M 151-¼-1600	3.57
Connect Plug, Cinch Mfg. Corp. DB-19604-432	3.49
Hood, Cinch Mfg. Corp. DB-51226-1	1.41

(The first four items are manufactured by Ortronics, Inc.; all items should be available through your local electronics supply firm)

This is not intended as a recommended list; it is a listing of the equipment we have used. However, we feel it significant to report that there have been no equipment failures with the Cousino materials in the 21 months of operation.

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Telephone Equipment

Telephone tariffs will vary from state to state, and the most economical installation may vary from one exchange to another within a state. The Wisconsin Telephone Company has been most helpful in advising on the most effective and economical service to fulfill the needs of the project, and it is recommended that contact be made with local telephone company representatives in determining the appropriate service.

1. Following is the equipment utilized in our initial system:

	Installation	Monthly
RXR telephone line	$7.00	$6.00
Recorder coupler	20.00	3.50

2. Establishment of a regional library in Milwaukee utilized the following equipment:

1MB telephone line	7.00	8.50
Auxiliary telephone line	7.00	4.25
Recorder coupler	20.00	3.50

3. To make the system toll-free for the calling physician the library can accept individual collect calls or, in Wisconsin and many other states, purchase an In-Wats telephone service on a monthly rental basis for incoming calls from a specific geographic area.

Unlimited In-Wats	600.00
Measured In-Wats (15 hours/month)	225.00

The System

The initial system involved a Cousino Repeater, Model R-7320, linked by means of the Cinch connector and hood to a recorder coupler and consequently to an RXR telephone line.

To enable the system to handle two calls at once, identical equipment was installed, with the provision that a second call coming in when the first recorder was in use would be automatically shifted to the second telephone line. The capacity of the system can be increased as much as desired in this method.

For ease of operation by library personnel, a simple control box has been added to each tape repeater. This shows whether the machine is available or in use, and enables the operator to stop and re-start the tape by push button control. This alteration costs approximately $30 per machine in labor and materials.

Selection of Topics

The Postgraduate Education Committee of the University Medical Center selects topics for recordings. The committee is composed of representatives of the major departments in the medical school, representatives of the State Medical Society of Wisconsin and the Wisconsin Academy of General Practice, and individuals with interest and expertise in continuing education.

Each departmental representative was asked to submit a list of ten potential subjects. Selection was to be based on their knowledge of their specialty fields and recall of questions asked most often by medical practitioners who consult with faculty members with considerable frequency. They were asked to consult departmental colleagues in development of the listings.

From a compilation of all recommendations, the entire committee made individual selections and suggested the faculty member most qualified to make a recording on the subject.

Production of Recordings

Following the approved listing, the departmental chairman personally called the selected faculty, explained the general guidelines to follow, and obtained a committment to do the tape.

The guidelines are:

1. The recording be 4-6 minutes in length.
2. It contain "core" information on the topic.
3. The information be useful in clinical practice.
4. Special attention be given to clearly listing steps in procedure or drug dosages.
5. The faculty member give his name and telephone number at the conclusion of the tape in case further information is needed.

Initially, recording was done with the Cousino Recorder-Repeater RR-7331. A small room was set aside for recording purposes. The project assistant would contact the faculty member after a committment had been made to the chairman. The faculty member was given a choice of recording in the small room provided or in his office. In either case, a cartridge was loaded with approximately 6 minutes of tape and he recorded directly onto the cartridge.

This procedure had one major advantage; it made this new and somewhat difficult experience as convenient as possible for the faculty member and decreased the demands on his time. The nearest recording studio was approximately one mile from the Medical Center.

It had many drawbacks, however. The primary one was poor quality of recording. There were also subsequent problems and even greater loss of quality in making a "master" tape from the initial cartridge.

Our second method of recording involved use of a tape recorder of medium price range in a room approximating studio conditions, with the recording done on regular audio tape. This preserved the convenience factor and increased the technical quality of the recordings. It is our feeling that a library of acceptable quality can be developed in this manner, however it is recommended that an audio engineer be consulted on the establishing of facilities and purchase of equipment.

The University Medical Center now has what we consider an ideal recording situation. Audio-visual teaching needs have grown to the point that the medical school has established a medical communications center with high quality equipment and competent staff. It is located adjacent to faculty offices and meets all of the technical criteria necessary to obtain high quality recordings.

There have been some continuing problems: Some physicians are not adequately prepared in advance (we are told it is more difficult to make a five-minute recording than to prepare a thirty-minute lecture). Physicians have difficulty in keeping appointments at the specific time the studio is reserved. Non-faculty lecturers outside Madison must be referred to their community radio station, and quality is not always as high as desired.

When the master recording is obtained, it is dubbed onto a larger reel and a statement identifying the service of the University is added. This reel eventually holds about eight recordings and serves as the "master" from which copies are made on lubricated tape for insertion in the cartridges.

To load the cartridges, a regular tape recorder and the Cousino U-Tape-It-Kit, K-6, are used. Full instructions are given in the kit, and with brief experience a person can become quite expert at this. The lubricated tape is wound from the reel onto the cartridge at the proper tension, it is pliced to make a continuous loop, and a piece of metallic tape is placed just before the start of the lecture. This metallic tape activates the automatic stop mechanism of the Cousino repeater.

The cartridge is designed in such a manner that the tape pulls out of the center of the spindle (thus the need for lubricated tape), goes across the head of the tape repeater, and is rewound on the outside of the spindle. In this way the operator merely starts the tape and walks away; it rewinds as it plays and automatically stops at the end.

Each lecturer is asked to sign a release of the content of the tape, assigning his rights to the Postgraduate Education Committee. Thus copies of the tapes can be made available to other institutions, on approval of the committee.

After full consideration of current copyright regulations, it was decided not to copyright the materials.

Initially there was a general provision that tapes would be reviewed and updated at least anually by the lecturer. This has been further refined to the point that the month in which the recording was made is stated at the end of the tape so the calling physician is aware of how current the information may be, and each tape is reviewed annually by the lecturer, another physician in the appropriate specialty, and a physician member of the Department of Postgraduate Medical Education.

Location of the Library

Primary consideration in selection of library location was that personnel be available 24-hours-a-day, 7-days-a-week, and that they be good public relations representatives for the University. It was also important initially that the services be cost-free, but salary support funds are now being made available on a limited basis in return for the service. Personnel in the University Hospitals Pharmacy met these qualifications and demonstrated considerable enthusiasm for the project. The pharmacy provides for coverage except for a brief period in early morning hours when the pharmacist on duty is absent to replenish drug supplies on the wards. It is doubtful in our minds that it is either necessary or economically feasible to provide staffing solely for the dial access library on a round-the-clock basis.

The library is compact, and presently occupies less than six feet of wall space in the pharmacy office. The tape repeaters are located on a shelf adjacent to the wall-hung telephones and the cartridges are stored nearby in numerical order for ease of selection.

Operation of the Library

Upon receipt of an incoming call, the pharmacist on duty identifies the service and asks for certain data regarding the calling physician. The physician specifies the desired tape, it is selected from the library, placed in the tape repeater, and the start button pressed.

After a few sentences, the pharmacist stops the tape, asks the caller if reception is good, and if so presses the start button and goes back to his duties. The process takes about 20 seconds. The tape plays through, shuts the machine off, and the caller breaks the connection when he hangs up.

Evaluation

Initially the evaluation of the system involved recording of data involving tape popularity, who is using the system, and when they are using it. (See Exhibit 1). This has now been expanded to include a survey of callers in an attempt to determine the reason for the call, whether or not it was an emergency, did the tape provide the information desired, was the information on the tape worthwhile, did they listen to the entire tape, and what topics they might suggest for expansion of the library. A random sample of the callers are surveyed by telephone to explore these questions in some depth (See Exhibit 2), and the remainder receive a post card questionnaire (See Exhibit 3)asking more simplified questions. The results of these evaluation attempts are attached as Exhibits and .

Key Personnel

Experience indicates that an acceptable library can be developed with a cooperative faculty and key personnel as follows:

Physician: It is considered important that contact with a potential lecturer be on a physician-to-physician basis. This enables a meaningful discussion of the criteria and content and a full understanding of the committment by the faculty member. The physician also finds it necessary to make decisions regarding content as the tapes are submitted to the library.

Project Assistant: This individual should be experienced in working with physicians, and consequently understand some of the difficulties in presenting medical information and the time demands on faculty members. It is felt that the "mechanical" functions can be readily acquired. We were particularly fortunate to obtain the services of a recently retired employee who had many years of service in the Out-patient Department of University Hospitals. Her background and personal acquaintance with faculty members was invaluable in launching the project. She rapidly acquired the ability to record presentations and perform the mechanical duties associated with preparation of cartridges. The present project assistant, who did not have a background of employment in the health field, has been able to develop an excellent rapport with the faculty.

Library Staffing: It is important that the library be staffed by personnel with an interest in the project and a feeling for public relations. We were particularly fortunate in obtaining the cooperation of University Hospitals Pharmacy personnel. They have assumed a responsibility and pride in the service, and due to their educational background and experience are able to assist the physician who calls with a specific problem but only a general knowledge of the library; they assist in selection of the proper tape and maintain contact until the physician has the information he desires. A regional library has been established at the Milwaukee County Hospital.

The following personnel are helpful, but not essential to the development and operation of a library:

Recording engineer: If a high quality service is desired, it is essential that the services of an experienced audio engineer be available, either on the staff or as a consultant. Competent recording personnel can significantly assist the faculty member in recording a good tape in the minimum amount of time. His advice on hardware and systems development can also be invaluable.

Coordinator: This is an administrative function to tie together the various functions of development and operation, take responsibility for carrying out the goals of the project, and develop the necessary promotion. Again it is helpful if this individual has had experience working with physicians.

Evaluator: Each sponsoring organization may have its own methods of evaluation or wish to develop them. Services of an educational psychologist or other person trained in evaluative techniques is important, either as part-time staff or as a consultant.

Student Help: Certain functions, such as winding of tapes on cartridges, are reasonably simple skills, but very time consuming. We have found it desirable to hire students for this function with savings in salaries and lessening of demands on the time of key project personnel.

Costs

With an experimental system, which offers so many alternatives in development, it is difficult to give dependable guidelines for budgeting. Hopefully the cost figures and personnel requirements listed in this report, along with local inquiries, will give sufficient information to arrive at a logical budget.

The following budget, based on our experience, may be considered the minimum for establishing a dial access service, assuming conditions and services approximate those existing on the University of Wisconsin campus. Figures are given for a library of 100 recordings, for establishment and operation for one year.

Sample Budget (Annual)

Personnel	
Physician	00.00
Project Assistant (Part-time)	2,500.00
Equipment	
Tape Repeaters (2 @ $100)	200.00
Cartridges (100 @ $2)	200.00
Cinch Plugs & Connectors (2 ea. @ $5)	10.00
U-Tape-It-Kit	11.00
Tape Splicer	6.00
Supplies	
Audio Tape (Master Recordings)	25.00
Lubricated Audio Tape	25.00
Metallic Tape	1.00
Telephone Services	
RXR's (2 @ $6/month)	144.00
Recorder couplers (2 @ $3.50/month)	84.00
Installation Costs	54.00
Miscellaneous	
Promotion	800.00
	$3,260.00

Cooperative Efforts

For institutions which wish to establish libraries in other states and regions, the University of Wisconsin will make available its current library. The intent is that this will offer a basic library on which the institution can build by recording its own tapes.

The basic library can be provided in one of two ways:

1. A set of master tapes at approximately $4.00 per topic.

2. A library of loaded cartridges at approximately $10.00 per cartridge.

A copy of the contract is attached as Exhibit . Interested institutions are asked to write a letter of intent, giving brief information on the institution, a general description of the proposed service, and the area to be covered by the service. This will be placed before the Postgraduate Education Committee for their consideration and a contract can be formalized upon their approval.

It is our hope that cooperation would extend to:

1. An exchange of tape recordings between the two institutions. (If this is determined in advance, the master tapes can be provided at a cost of $2.00 per topic, rather than $4.00 as stated above.)

2. Coordination of evaluative efforts so that appropriate data can be pooled for all libraries.

3. Exchange of information on changes and improvements in the system.

Contact Personnel

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EXHIBIT 1

TELEPHONE DIAL ACCESS
MEDICAL TAPE RECORDING LIBRARY

1. Summary

a. Wisconsin calls	1,219
b. Out-of-state calls	640
c. Total calls	1,859
d. Average calls per day	5.09

e. Calls received from:
   1. 70 Wisconsin communities
   2. 37 states, Washington, D.C., and Montreal and Ottawa, Canada

2. Utilization by Subject Matter

	Percent of tapes	Percent of Use
Int. Medicine	22.4	15.8
Neurology	11.5	7,4
Ob-Gyn	4.7	7.4
Oncology	5.7	1.2
Pediatrics	28.6	27.8
Psychiatry	4.2	23.6
Radiology	3.6	1.0
Surgery	16.1	6.5
Urology	3.1	8.3

3. Utilization by Type of Practice

	Number	
General Practice	341	18.3
Specialty Practice	454	34.4
House Staff	70	3.8
Medical Students	319	17.1
Others & Those Not Recorded	675	36.3

4. Utilization by Day of Week

Monday	371	19.6
Tuesday	342	18.4
Wednesday	325	17.0
Thursday	342	18.4
Friday	248	13.4
Saturday	127	7.0
Sunday	102	5.4

5. Utilization by Time of Day

	Calls	&
12:01 to 6 A.M.	23	1.2
6:01 to 12 Noon	453	24.4
12:01 to 6 P.M.	710	38.2
6:01 to 12 Midnight	511	27.5
Not Recorded	162	8.0

EXHIBIT 2

TELEPHONE DIAL ACCESS TAPE LIBRARY

PHONE EVALUATION

Month:_____ Year:_____
Practice: Call #:
GP:_____
Spec:_____
H. Staff:_____
H. Std:_____

Name_____ City_____ Phone_____

Tape Requested: (No)_____ (Title)_____

Yes	No	
		SPECIFIC MEDICAL PROBLEM
___	___	(1) Was call made to gain info on management of a specific medical problem?
___	___	(2) Was problem an emergency? Nature of problem:_____
		OTHER REASON FOR CALL
		(3) Reason for call?
___		Review or update knowledge
___		Gain new information
___		Curiousity about system
___		Other (EXPLAIN)
___	___	(4) Did call provide info you wanted?
		Use made of information
		Adequacies or inadequacies of information or format

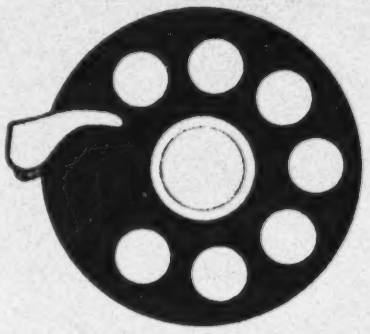
Yes	No	
___	___	(5) Did you take notes or tape for reference?
___	___	(6) Have you consulted any other sources for info on same topic or problem?
		Source(s) _____
		(7) How did use of DAL compare with these sources?
		_____ More valuable
		_____ Equally valuable
		_____ Less valuable
___	___	(8) Did you listen to the entire tape? _____
___	___	(9) Did you contact the author for any further information?
___	___	(10) Have you every used DAL before? _____
		(11) How did you learn about the DAL? _____
___	___	(12) Would you be interested in an expansion of the Dial Access Library? Suggestions for topics:

EXHIBIT 3

WISCONSIN
DIAL ACCESS
LIBRARY

Survey

PLEASE HELP
EVALUATE THIS
SERVICE



M.D. EVALUATION call #: _____

1. Was this call made to gain information on the management of a specific medical problem?

   ☐ Yes

   a. Was problem an emergency?

      ___Yes ___No

   b. Did call provide information you wanted?

      ___Yes ___No

   ☐ No specific problem

   Reason for call: (check 1)

   a. ___ review or update knowledge
   b. ___ gain new information
   c. ___ curiosity about the service
   d. ___ other (please specify) _____

2. Did you listen to the entire tape? ☐ Yes ☐ No

3. Did you feel the information you received from the tape was worth the time it took you to call? ☐ Yes ☐ No

4. Would you be interested in an expansion of the tape library?
   ☐ Yes ☐ No If "YES," what topics would you suggest?

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